Instructions For Use

Version 1.1.7

Sheet metal working machine

SAR 3:1 - 1000

Cutting | Edge bending | Circular bending

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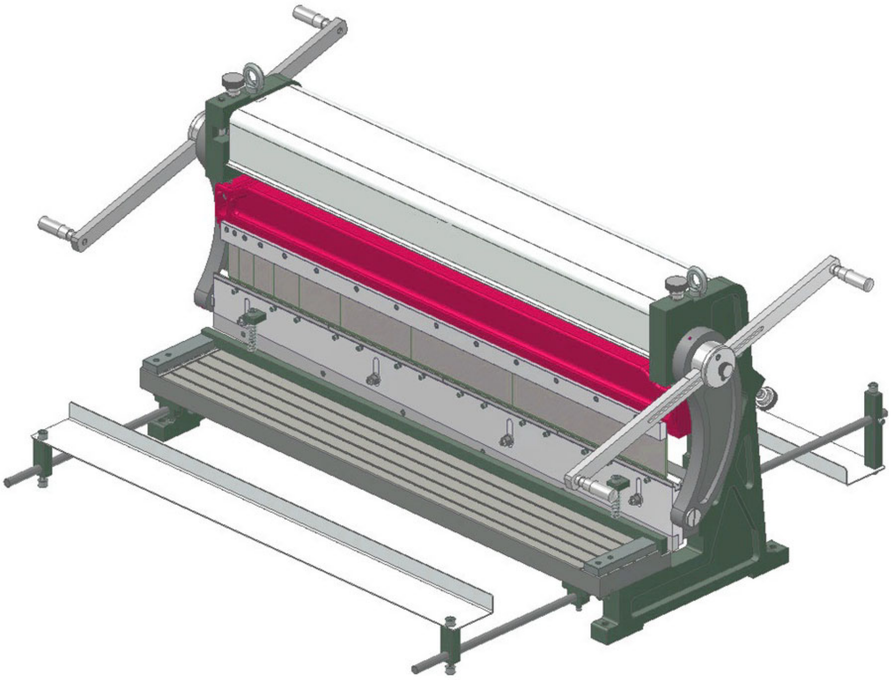


1 Preface

Dear customer, Thank you very much for purchasing this product made by OPTIMUM.

Please note. The sheet metal working machine is not a machine in the sense of the Machinery Directive. This product is powered only by the human hand. An declaration of conformity of the sheet metal working machine according to valid European directives is not possible, since the sheet metal working machine is neither a toy, electrical appliance, machine, medical device, elevator, or a personal protective equipment.

Nevertheless, as a user, you must observe these operating instructions to ensure safe commissioning and operation!

Damages caused by the disregard of this user manual are not subject to warranty. The dealer will not accept liability for any resulting defects or problems.

Every person involved with the installation, operation and maintenance of this sheet metal working machine have to:

- be qualilfied,
- follow the instructions of this manual.

2 Safety instructions

2.1 Classification of hazards

We classify the safety warnings into different categories. The table below gives an overview of the classification of symbols (ideogram) and the warning signs for each specific danger and its (possible) consequences.

Symbol	Alarm expression	Definition / consequence
	DANGER!	Impending danger that will cause serious injury or death to people.
	WARNING!	A danger that can cause serious injury or death.
	CAUTION!	A danger or unsafe procedure that can cause personal injury or damage to property.
	ATTENTION!	Situation that could cause damage to the product, as well as other types of damage. No risk of injury to persons.
	INFORMATION	Practical tips and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

In case of specific dangers, we replace the pictogram with

general danger

with a warning of

injury to hands,

danger of tipping

or

rotating parts.

In addition to these operation instructions, please observe

- the applicable laws and regulations,
- the statutory provisions for accident prevention,
- the prohibition, warning and mandatory signs as well as the warning notes on the sheet metal working machine.

Always keep this documentation close to the sheet metal working machine.

INFORMATION

If you are unable to rectify an issue using these operating instructions, please contact us for advice:

Optimum Maschinen Germany GmbH
Dr. Robert-Pfleger-Str. 26

D-96103 Hallstadt, Germany

Email: info@optimum-maschinen.de

2.2 Intended use

WARNING!

In the event of improper use, the sheet metal working machine

- **will endanger personnel,**
- **will endanger the machine and other material property of the operating company,**
- **the functionality of the sheet metal working machine may be compromised.**

The sheet metal working machine is intended for cutting, bending and round bending of metallic materials. Applying stronger forces by using additional levers is not allowed.

If the sheet metal working machine is used in any way other than described above, or modified without the approval of Maschinen Germany GmbH, then the milling machine is being used improperly.

We will not be held liable for any damages resulting from any operation which is not in accordance with the intended use.

We expressly point out that the guarantee will expire, if any constructive, technical or procedural changes are not performed by the company Optimum Maschinen Germany GmbH.

It is also part of the intended use that you

- observe the limits of the sheet metal working machine,
- the operating manual is observed,
- the inspection and maintenance instructions are observed.

2.3 Personal protective equipment

For some works you need personnel protective equipment as protective equipment. These are

- Safety helmet,
- protective glasses or face guard,
- protective gloves,
- safety shoes with steel toe caps,
- ear protection.

Before starting work make sure that the required personnel protective equipment is available at the work place.

CAUTION!

Dirty or contaminated personnel protective equipment can cause illness.

Clean your personal protective equipment

- **after each use,**
- **regularly once a week.**

Personal protective equipment for special works

Protect your face and your eyes: Wear a safety helmet with facial protection when performing work where your face and eyes are exposed to hazards.

Wear protective gloves when handling pieces with sharp edges.

Wear safety shoes when you assemble, disassemble or transport heavy components.

3 Delivery, interdepartmental transport, unpacking

INFORMATION

The sheet metal working machine is delivered pre-assembled. It is delivered in a transport box. After the unpacking and the transportation to the installation site it is necessary to mount and assemble the individual components of the sheet metal working machine.

3.1 Delivery

Check the status of the machine immediately upon receipt and claim possible damages at the last carrier also if the packing is not being damaged. In order to ensure claims towards the freight carrier we recommend you to leave the machines, devices and packing material for the time being in the status at which you have determined the damage or to take photos of this status. Please inform us about any other claims within six days after receipt of delivery.

Check if all parts are firmly seated.

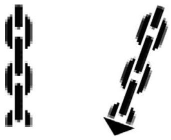
3.2 Interdepartmental transport

WARNING!

Severe or fatal injuries may occur if the sheet metal working machine or parts of the machine tumble or fall down from the forklift truck or from the transport vehicle. Follow the instructions and information on the transport box:

- Centres of gravity

- (Marking of the positions for the load suspension gear)



- Prescribed transportation position (Labelling of the top surface)

- Means of transport to be used
- Weights

WARNING!

The use of damaged lifting and load suspension equipment without sufficient load capacity that might break under load can cause severe injuries or even death.

Check that the lifting and load suspension equipment has sufficient load capacity and that it is in perfect condition. Observe the accident prevention regulations. Fasten the loads carefully. Never walk under suspended loads!

3.3 Scope of delivery

- Sheet metal working machine 3 in 1
- 1 piece of stop bars with stop behind
- 1 piece stop bars with stop front
- 1 x operating instruction

3.4 Set-up and assembly

If the sheet metal working machine is not placed directly on the ground, for example, when it is used on a construction site, the sheet metal working machine should be fixed on the provided substructure which is sufficiently capable of bearing, using the designated drill-holes. Please note that there might be additional danger of overturning when using levers. Note that the lever operation creates an additional risk of tipping.

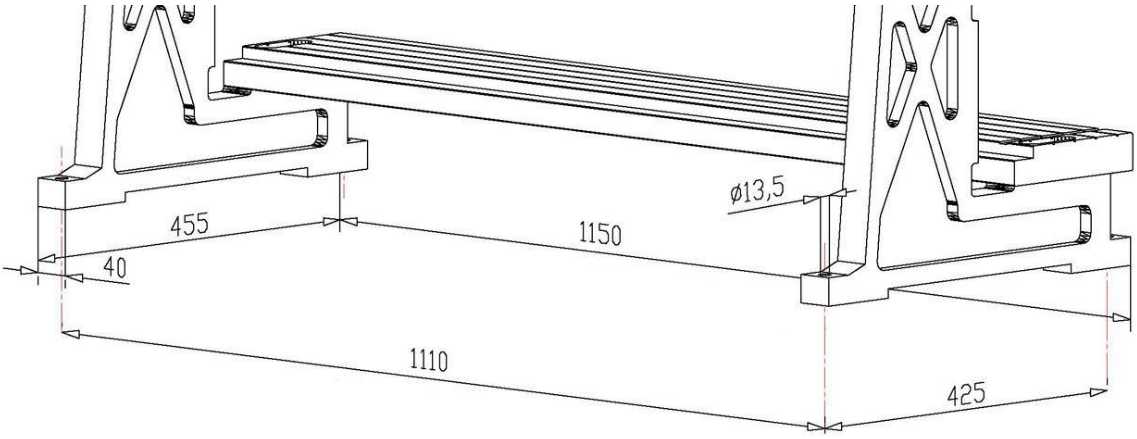
WARNING!

An insufficiently fixed sheet metal working machine can tip over.

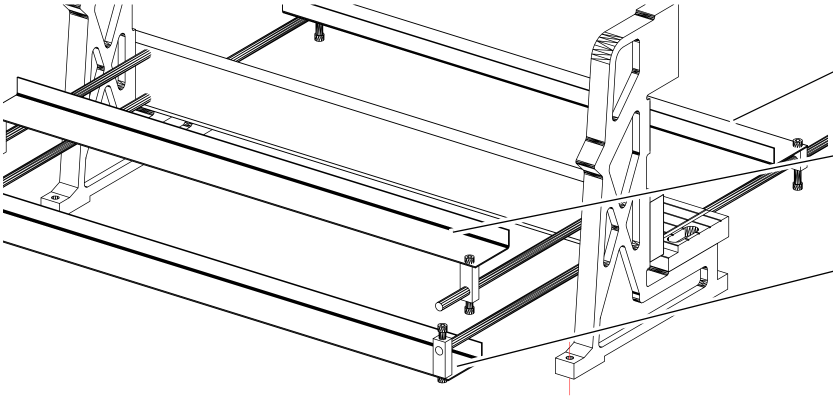
3.4.1 Fixing

ATTENTION!

Fix the sheet metal working machine at the designated drill-holes (4 pcs) onto the subsoil.



3.4.2 Mounting of stops



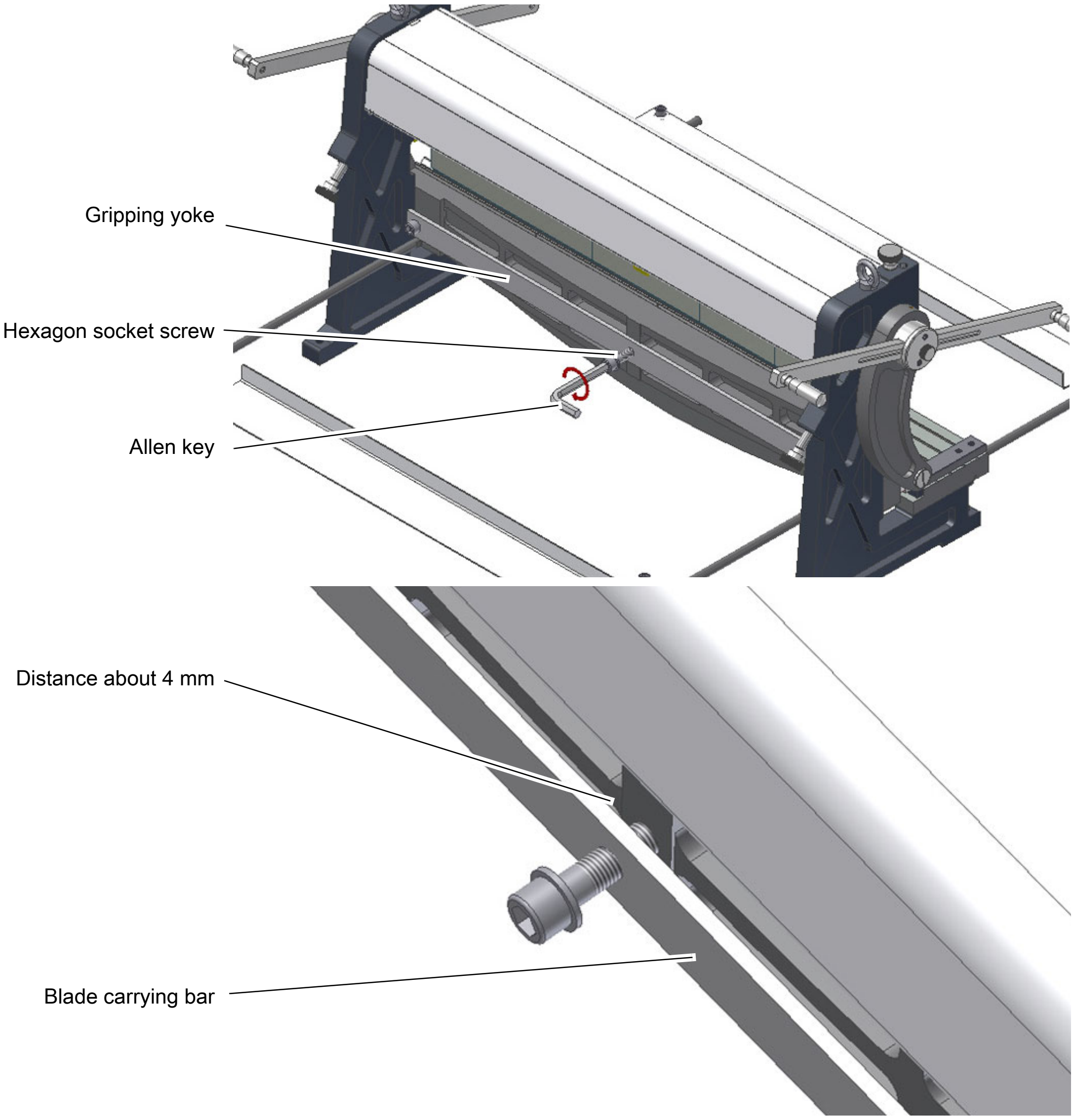
4 Settings before first use

4.1 Setting the gripping yoke

INFORMATION

The gripping yoke is delivered without tension. Before starting the operation the gripping yoke needs to be set.

→ Set the spring tension by means of the hexagon socket screw. Make sure that the distance between the gripping yoke and the blade carrying bar amounts to about 4 mm.



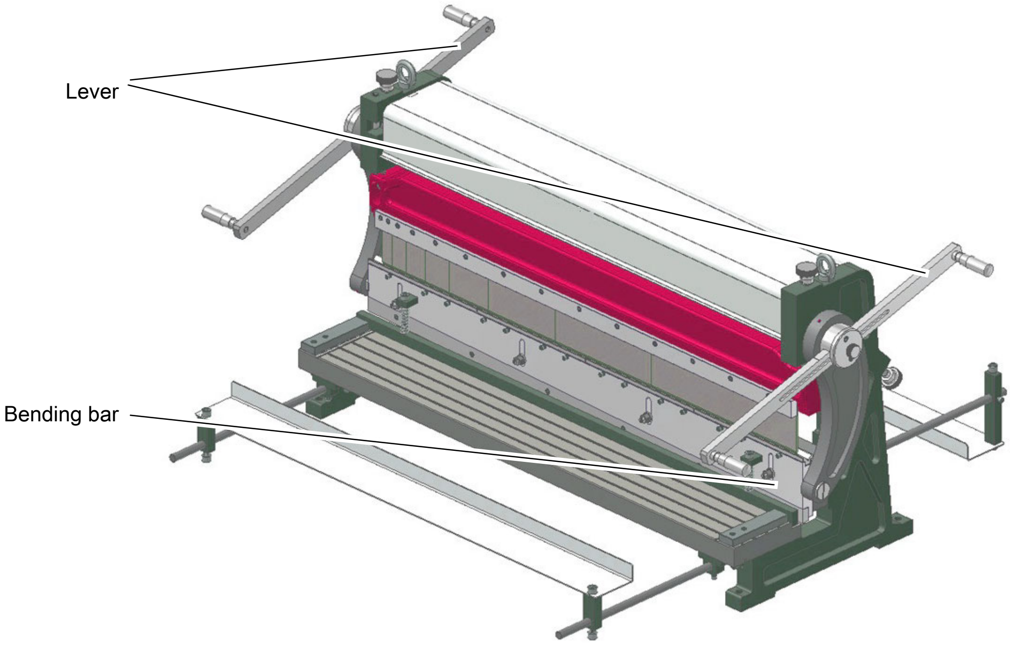
Img.4-1: Setting the gripping yoke

4.2 Recommended settings for edge bending

INFORMATION

It is possible to bend edges up to 90°. To do so, it is necessary to perform the following settings and working steps. Sheet metals which are ductile due to their material properties will "spring back". It might be necessary to manually perform the edge bending to exactly 90° by "over-bending".

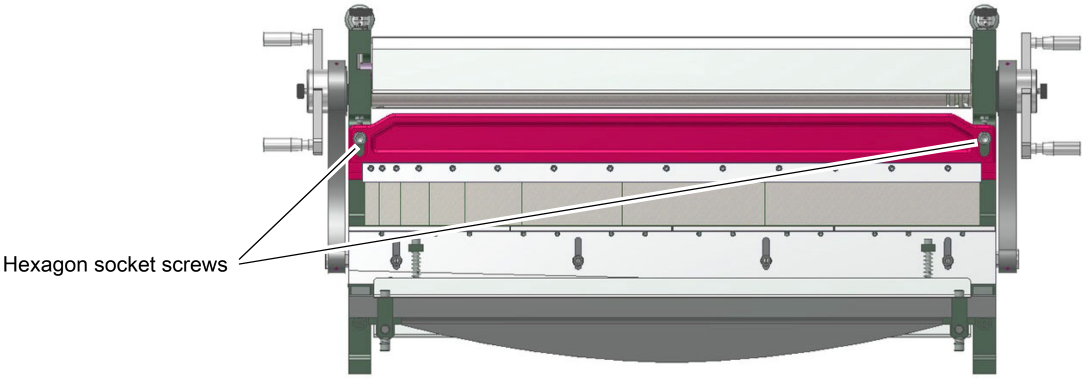
→ Turn the bending bar to the top death center by means of the laterally arranged levers.



Img. 4-2: Lever left and right

→ Unscrew the hexagon socket screws on both sides of the bending machine using an appropriate Allen key.

→ Lower the die onto the bending rail.



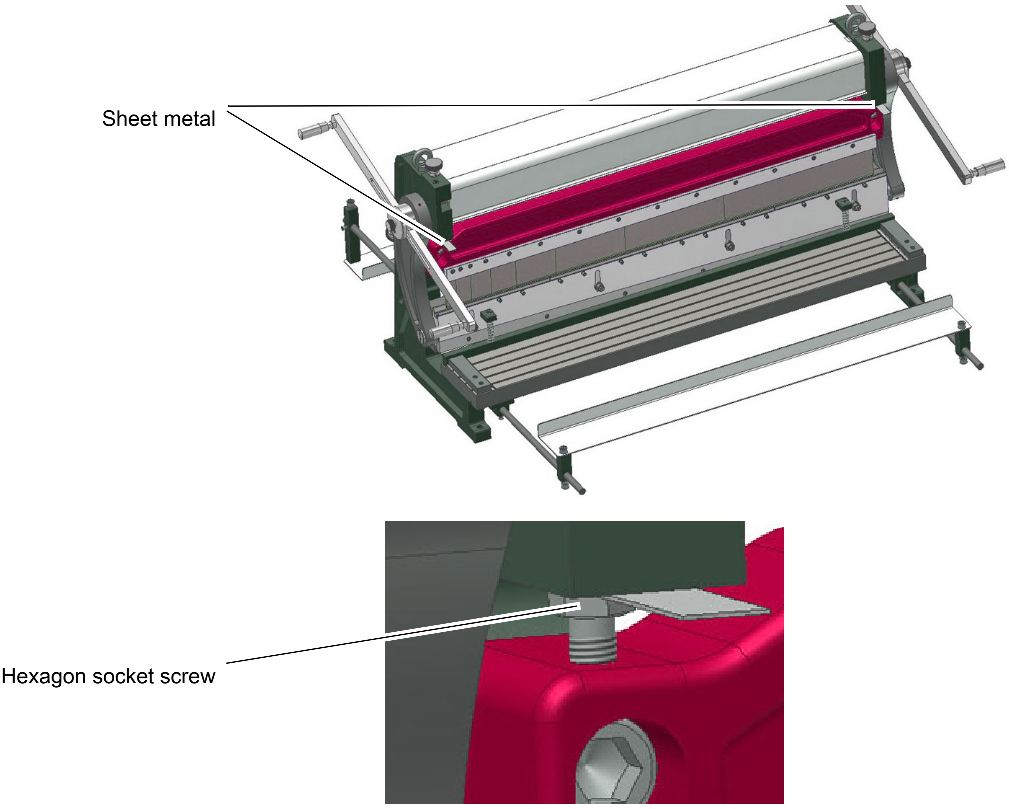
Img. 4-3: Unscrew the hexagon socket screws

→ Put sheet metals on both sides into the spacing. Choose the setting sheet metals depending on the thickness of the sheet metal which you would like to bend.

INFORMATION

Sheet metals for setting the edge bending machines are not included in shipment. We recommend you to use waste material in order to prepare setting sheet metals of different or common sheet metal thickness's.

→ Turn the hexagon socket screw up until the sheet metal is clamped so that it can no longer be removed manually.



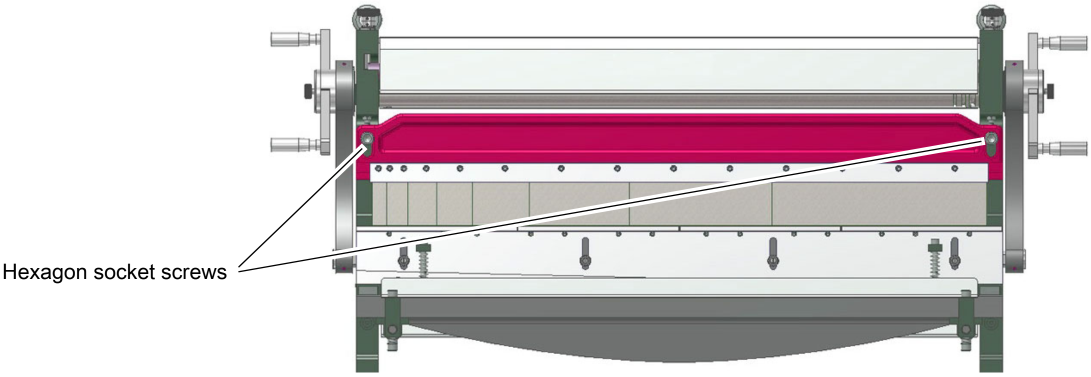
Img.4-4: Insert and clamp stell sheets

→ Turn the hexagon socket screws slightly using an appropriate Allen key.

→ Remove the sheet metals when you have performed the setting.

→ Perform a trial bending in order to align the bending bar at the top end stop.

→ Tighten the hexagon socket screws.



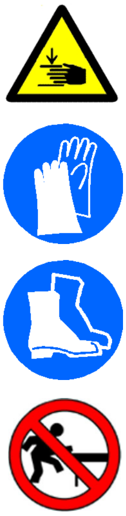
Img.4-5: Tighten the hexagon socket screws

5 Operation

The sheet metal working machine is used for

- cutting,
- edge folding and
- round bending

of sheet metals. When the lever on the sheet metal working machine is actuated, 3 simultaneous motions are performed at different locations. Always clamp the motion lever, this would avoid the displacement of the lever which is not used during the working process.



WARNING!

Observe that during the work with the sheet metal working machine the operation of one lever always actuates the compaction roller for bending, the folding bar and the shear blade.

Always inform anyone who stays in the danger zone of the universal device or helps you with your work on the sheet metal working machine about this event.

Wear safety gloves, since sheet metals always have sharp edges or a cutting ridge.

Wear safety boots.

Do not climb onto the sheet metal working machine.

5.1 Round bending

Sheets can be formed into semi-circles or tubes by round bending or rolling. The two front rollers (feed rollers) are used to set the sheet thickness so that the sheet can be moved to the rear roller by adhering to the rollers. The rear roller (unwinding roller) is used to set the bend that the sheet is to receive as it passes this roller. Large or thick-walled sheets should be bent to the desired diameter in stages, as the static friction on the movement rollers is not sufficient to form thicker sheets in a single operation. In this context, it is also important to ensure that the sheet metal is free of dirt, grease or other coatings that could impair static friction.

5.2 Edge bending

Sheet metal is bent during folding. Bending can take place up to 90°. For sheets that are tough due to their material properties, ‘springback’ occurs. Bending to exactly 90° is not possible or must be done manually by ‘overbending’. If sheets that have already been formed are to be bent, individual bending segments can be dismantled. The resulting free space is 80 mm in height.

5.3 Cutting

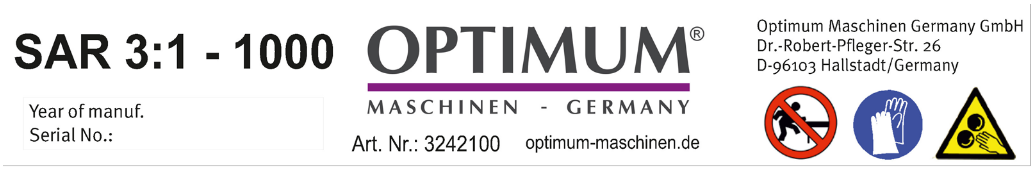
Cutting or shearing is performed by a fixed lower blade and a movable upper blade. The upper blade moves downwards and the cut is made from right to left.

5.4 Maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. We recommend lubricating bare steel surfaces regularly.

6 Technical specification

6.1 Rating plate



SAR 3:1 - 1000

OPTIMUM®
MASCHINEN - GERMANY

Year of manuf.
Serial No.:

Art. Nr.: 3242100
optimum-maschinen.de

Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26
D-96103 Hallstadt/Germany

Img. 6-1: Rating plate

The following information represents the dimensions and indications of weight and the manufacturer‘s approved machine data.

6.2 Round bending	
Maximum width of material [mm]	700
Diameter bending minimum [mm]	48
Diameter bending maximum [mm]	unlimited
Steel plate St37 up to [mm]	1
Stainless steel up to [mm]	0.5
Aluminium / Copper up to [mm]	1.5
Brass up to [mm]	1
Gold / silver / tinplate up to [mm]	1.5
Diameter pay-off roll [mm]	48

6.3 Edge bending	
Maximum width of material [mm]	700
Maximum sheet thickness [mm]	2.5
Steel plate St37 up to [mm]	1
Aluminium / Copper up to [mm]	1.5
Number of segments	7

6.4 Cutting	
Maximum width of material [mm]	700
Steel plate St37 up to [mm]	1
Stainless steel up to [mm]	0.5
Aluminium / Copper up to [mm]	1

6.5 Dimensions	
Length / Width / Hight [mm]	1455 x 565 x 790
Total weight [kg]	290

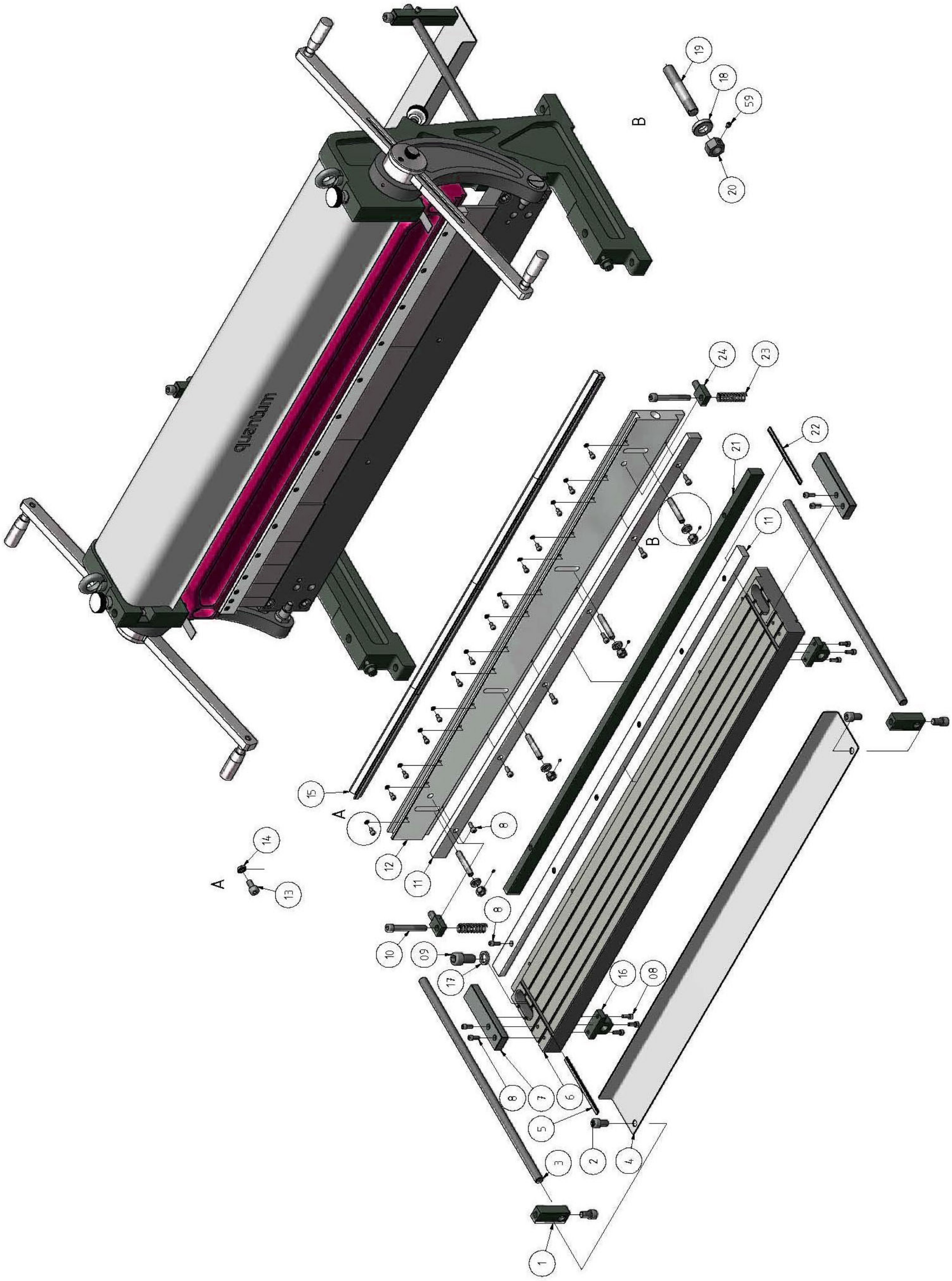
6.6 Operating material	
Guideways, Oiler	for example machine oil (Mobil, Fina, ...)

6.7 Emissions

The sheet metal working machine SAR does not have emissions.

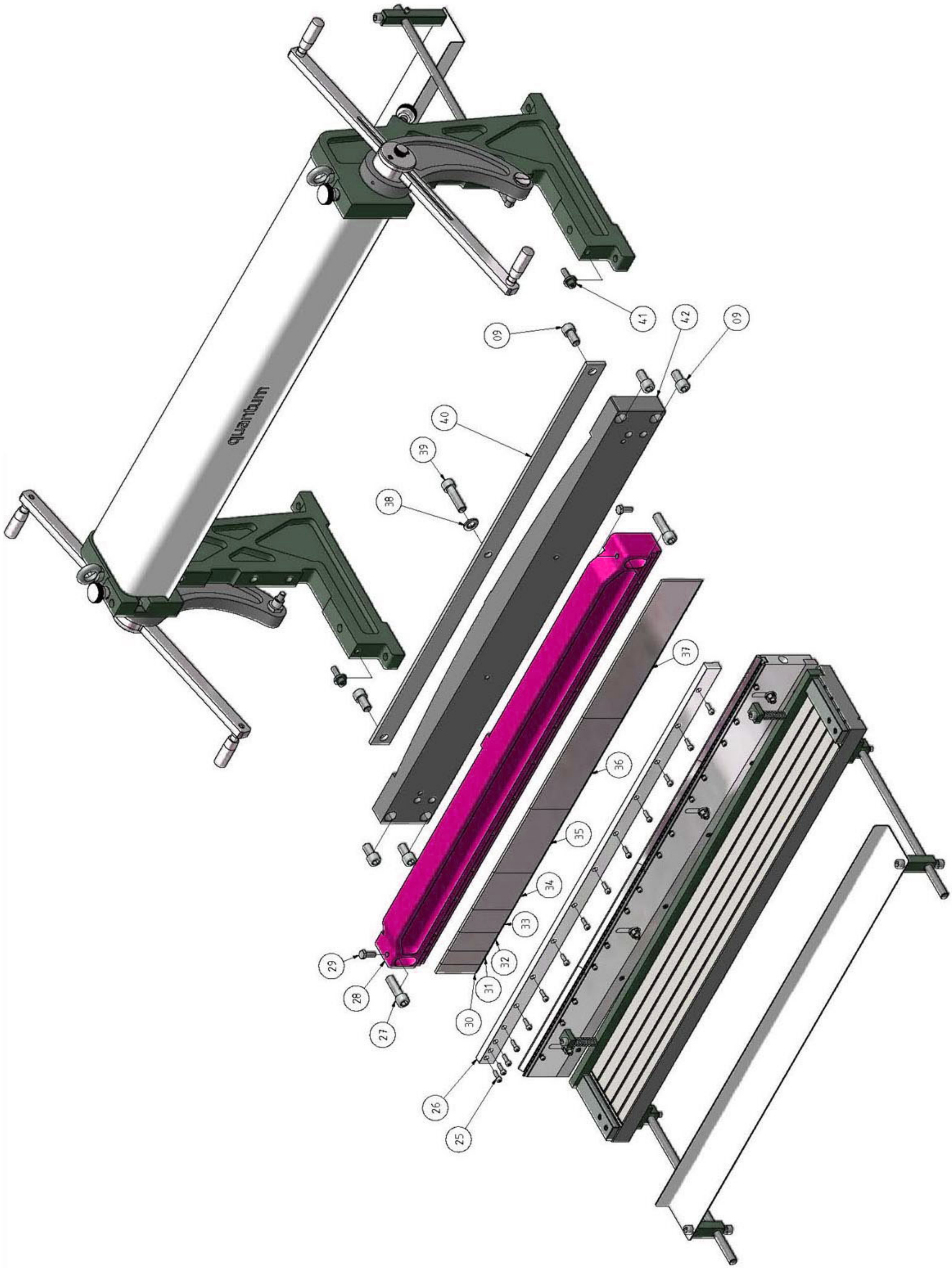
7 Ersatzteile - Spare parts

7.1 Ersatzteilzeichnung 1-4 - Spare parts drawing 1-4



7-1: Ersatzteilzeichnung 1-4 - Drawing spare parts 1-4

7.2 Ersatzteilzeichnung 2-4 - Drawing spare parts 2-4



7-2: Ersatzteilzeichnung 2-4 - Drawing spare parts 2-4

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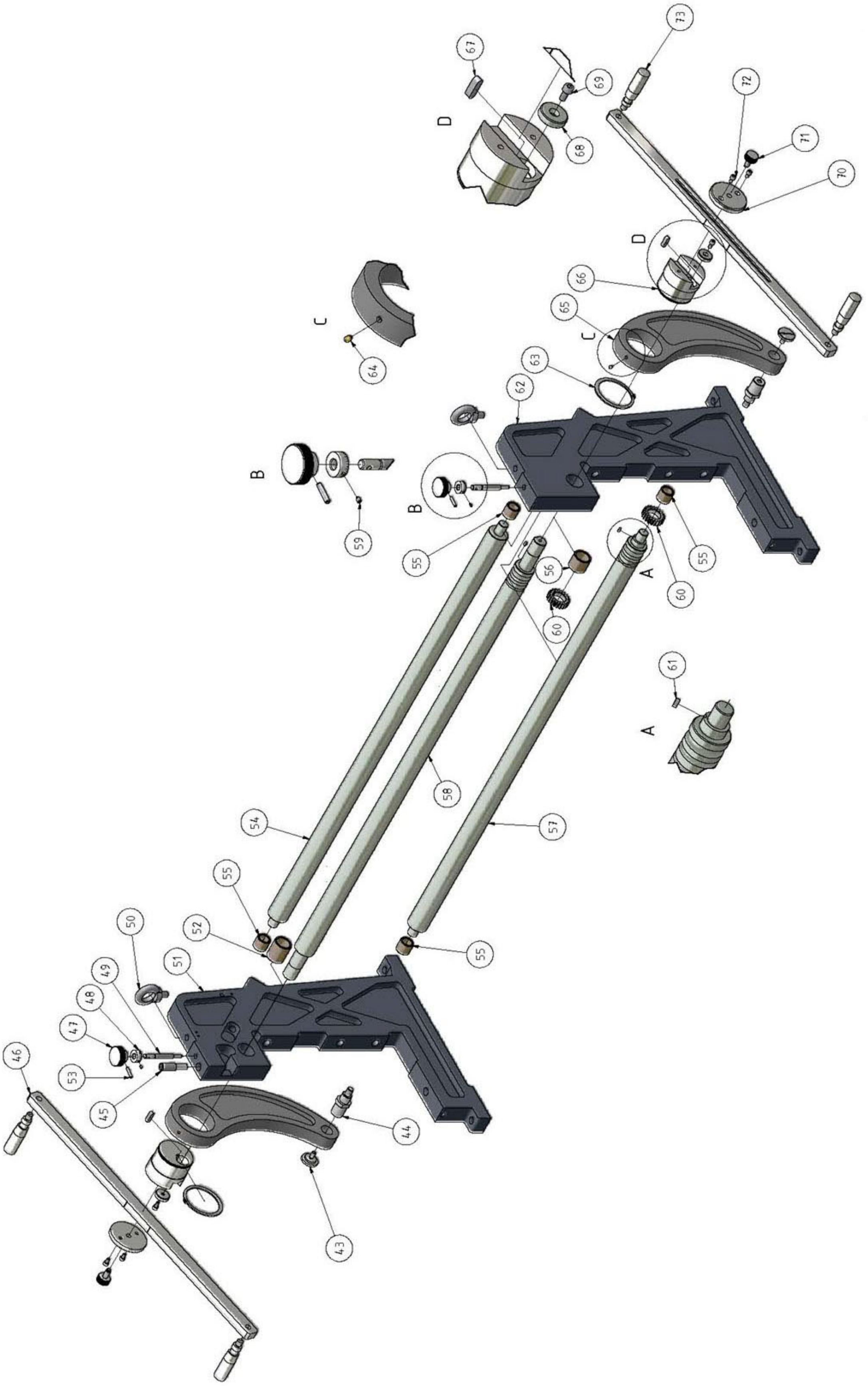
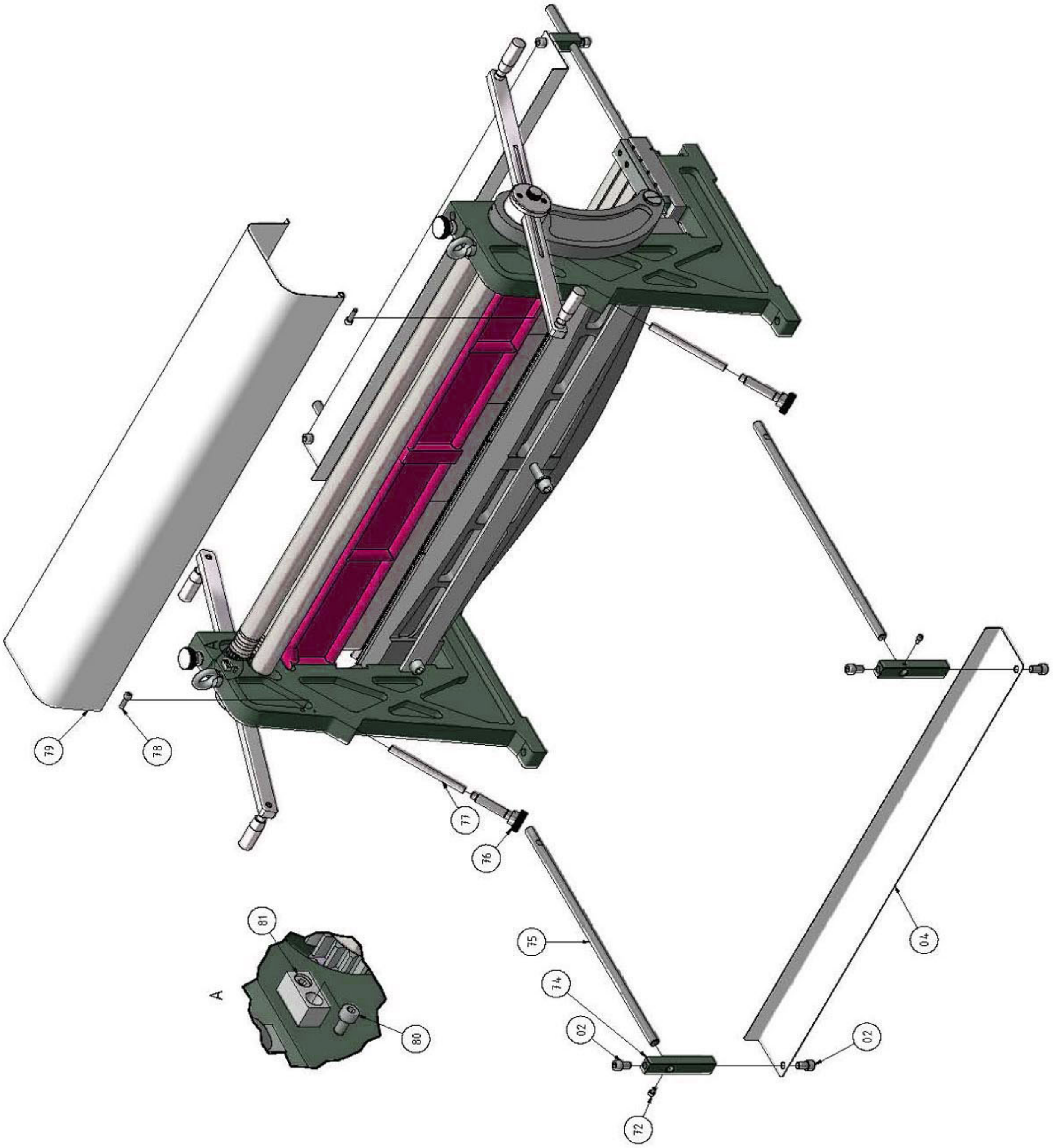
7.3 Ersatzteilzeichnung 3-4 - Drawing spare parts 3-4



7-3: Ersatzteilzeichnung 3-4 - Drawing spare parts 3-4

7.4 Ersatzteilzeichnung 4-4 - Drawing spare parts 4-4



7-4: Ersatzteilzeichnung 4-4 - Drawing spare parts 4-4

7.5 Teileliste - Parts list

1	Lagerbock	Support block		2	0324210001
2	Zylinderschraube	Socket head screw	M10x20	2	
3	Führungsbolzen	Guide bolt		2	0324210003
4	Anschlagblech	Limit plate	SAR 750	2	0324207504
4	Anschlagblech	Limit plate	SAR 1000	2	0324210004
5	Skala, links	Scale, left		1	0324210005
6	Auflagetisch	Supporting table	SAR 750	1	
6	Auflagetisch	Supporting table	SAR 1000	1	0324210006
7	Anschlag	Stopper		2	0324210007
8	Zylinderschraube	Socket head screw	GB 70-85/M6x16	16	
9	Zylinderschraube	Socket head screw	GB 70-85/M16x30	8	
10	Zylinderschraube	Socket head screw	GB 70-85/M10x80	2	0324210010
11	Obermesser, Untermesser	Top knife, Lower knife	SAR 750	2	0324206511
11	Obermesser, Untermesser	Top knife, Lower knife	SAR 1000	2	0324210011
12	Wangenbalken	Guide carrier	SAR 750	1	0324207512
12	Wangenbalken	Guide carrier	SAR 1000	1	0324210012
13	Zylinderschraube	Socket head screw	GB 70-85/M5x10	14	
14	Sechskantmutter	Hexagon nut	ISO 4035-M5	14	
15	Kantwange	Kant cheek	SAR 750	3	
15	Kantwange	Kant cheek	SAR 1000	4	0324210015
16	Lagerbock	Support block		2	0324210016
17	Scheibe	Washer		2	
18	Scheibe	Washer		4	
19	Gewindestift (neue Version)	Grub screw (new version)		2	03242075191
20	Sechskantmutter	Hexagon nut		4	0324210020
21	Niederhalter	Blank holder	SAR 750	1	0324207521
21	Niederhalter	Blank holder	SAR 1000	1	0324210021
22	Skala, rechts	Scale, right		1	0324210022
23	Feder	Spring		2	0324210023
24	Führungsstück	Guide piece		2	0324210024
25	Zylinderschraube	Socket head screw	GB 70-85/M6x20	14	
26	Klemmschiene	Terminal strip	SAR 750	1	
26	Klemmschiene	Terminal strip	SAR 1000	1	0324210026
27	Zylinderschraube	Socket head screw	GB 70-85/M16x55	2	
28	Kantbalken	Balk	SAR 750	1	
28	Kantbalken	Balk	SAR 1000	1	0324210028
29	Sechskantschraube	Hexagonal screw	ISO 4017- M10x25	2	
30	Abkantsegment, Set	Folding , Set	1-1/2"	1	0324210030
31			2"	1	
32			2-1/2"	1	
33			3"	1	
34			4"	1	
35			7"	1	
36			10"	1	
37			15"	1	
38	Scheibe	Washer	16	1	
39	Zylinderschraube	Socket head screw	GB 70-85/M16x60	1	
40	Spannbrücke Messerbalken	Slide rail	SAR 750	1	
40	Spannbrücke Messerbalken	Slide rail	SAR 1000	1	0324210040
41	Schraube	Screw		2	0324210041
42	Messerbalken	Knife bar	SAR 750	1	
42	Messerbalken	Knife bar	SAR 1000	1	0324210042
43	Schraube	Screw		2	0324207543
44	Bolzen	Bolt		2	0324207544
45	Stiftschraube	Screw		1	
46	Hebel	Lever		2	0324210046
47	Rändelschraube	Knurled screw		2	0324210047
48	Kalibrierungsbuchse	Calibration bush		2	0324210048
49	Stellschraube	Adjusting screw		2	
50	Ringschraube	Eyebolt	GB 825-88/M12	2	
51	Seitenteil links	Side frame, left		1	0324210051
52	Hülse	Bushing		1	0324210052
53	Spannstift	Spring pin	ISO 8752/5x24	2	
54	Abrollwalze	Roll	SAR 750	1	
54	Abrollwalze	Roll	SAR 1000	1	0324210054
55	Hülse	Bushing		4	0324210055
56	Hülse	Bushing		1	0324210056
57	Oberwalze	Top roll	SAR 750	1	
57	Oberwalze	Top roll	SAR 1000	1	0324210057
58	Unterwalze	Down roll	SAR 750	1	0324207558
58	Unterwalze	Down roll	SAR 1000	1	0324210058
59	Gewindestift	Grub screw	ISO 4028/M4x6	6	
60	Zahnrad	Gear wheel		2	0324210060
61	Passfeder	Fitting key	DIN 6885/4x4x10	2	0324210061
62	Seitenteil rechts	Side frame right		1	0324210062
63	Sicherungsring	Retaining ring	DIN 471/75x2.5	2	
64	Schmiernippel	Lubrication cup	JB-T7940.4-1995-8mm	4	
65	Exzenter	Eccentric		2	0324210065
66	Aufnahme	Feeder plate		2	0324210066
67	Passfeder	Fitting key	DIN6885/8x7x25	2	
68	Scheibe	Washer		2	
69	Zylinderschraube	Socket head screw	GB 70-85/M6x12	2	
70	Deckel	Cover		2	
71	Klemmschraube	Clamp screw		2	0324210071
72	Zylinderschraube	Socket head screw	GB 70-85/M6x10	6	
73	Griff	Handle		4	0324210073
74	Lagerbock	Bearing Block		2	0324210074
75	Anschlagstange	Guide rod		2	
76	Stellschraube	Adjusting screw		2	0324210076
77	Schubstange	Connecting rod		2	
78	Zylinderschraube	Socket head screw	GB 70-85/M8x25	2	
79	Abdeckhaube	Protective cover	SAR 750	1	
79	Abdeckhaube	Socket head screw	SAR 1000	1	0324210079
80	Zylinderschraube	Socket head screw	GB 70-85/M4x10	4	
81	Anschalg	Block		2	
Z	Zubehör	Accessory		1	0324210000

8 Appendix

8.1 Copyright

This document is protected by copyright. All derived rights are reserved, especially those of translation, re-printing, use of figures, broadcast, reproduction by photo-mechanical or similar means and recording in data processing systems, either partial or total. Subject to technical changes without notice.

8.2 Liability claims/warranty

Besides the legal liability claims for defects of the customer towards the seller, the manufacturer of the product, OPTIMUM GmbH, Robert-Pfleger-Straße 26, D-96103 Hallstadt, does not grant any further warranties unless they are listed below or were promised as part of a single contractual provision.

- Liability or warranty claims are processed at OPTIMUM GmbH's discretion either directly or through one of its dealers.
  Any defective products or components of such products will either be repaired or replaced by components which are free from defects. Title to replaced products or components is transferred to OPTIMUM Maschinen Germany GmbH.
- The automatically generated original proof of purchase which shows the date of purchase, the type of machine and the serial number, if applicable, is the precondition in order to assert liability or warranty claims. If the original proof of purchase is not presented, we are not able to perform any services.
- Defects resulting from the following circumstances are excluded from liability and warranty claims:
  - Using the product beyond the technical options and proper use, in particular due to over-straining of the device.
  - Any defects arising by one's own fault due to faulty operations or if the operating manual is disregarded.
  - Inattentive or incorrect handling and use of improper equipment
  - Unauthorized modifications and repairs
  - Insufficient installation and safeguarding of the machine
  - Disregarding the installation requirements and conditions of use
  - atmospheric discharges, overvoltage and lightning strokes as well as chemical influences
- Neither are the following items covered by liability or warranty claims:
  - Wearing parts and components which are subject to normal and intended wear, such as V-belts, ball bearings, lighting, filters, seals, etc.
  - Non reproducible software errors
- Any services, which OPTIMUM GmbH or one of its agents performs in order to fulfil any additional warranty are neither an acceptance of the defects nor an acceptance of its obligation to compensate. These services neither delay nor interrupt the warranty period.
- The court of jurisdiction for legal disputes between businessmen is Bamberg.
- If any of the aforementioned agreements is totally or partially inoperative and/or invalid, a provision which nearest approaches the intent of the guarantor and remains within the framework of the limits of liability and warranty which are specified by this contract is deemed agreed.

8.3 Advice for disposal / Options of reuse:

Please dispose of your equipment in an environmentally friendly manner, by not placing waste in the environment but in a professional manner.

Please do not simply throw away the packaging and later the disused machine, but dispose of both in accordance with the guidelines laid down by your city council/local authority or by an authorised disposal company.

8.3.1 Disposal of new device packaging

All used packaging materials and packaging aids from the machine are recyclable and generally need to be supplied to the material reuse.

The packaging wood can be supplied to the disposal or the reuse.

Any packaging components made of cardboard box can be chopped up and supplied to the waste paper collection.

The films are made of polyethylene (PE) and the cushion parts are made of polystyrene (PS). These materials can be reused after reconditioning if they are passed to a collection station or to the appropriate waste management enterprise.

Only forward the packaging materials correctly sorted to allow direct reuse.

8.3.2 Disposal of the sheet metal working machine

INFORMATION

Please take care in your interest and in the interest of the environment that all component parts of the sheet metal working machine are only disposed of in the intended and admitted way.

The sheet metal working machine SAR 3:1 - 1000 is made of metal and contains no lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, or polybrominated diphenyl ethers.